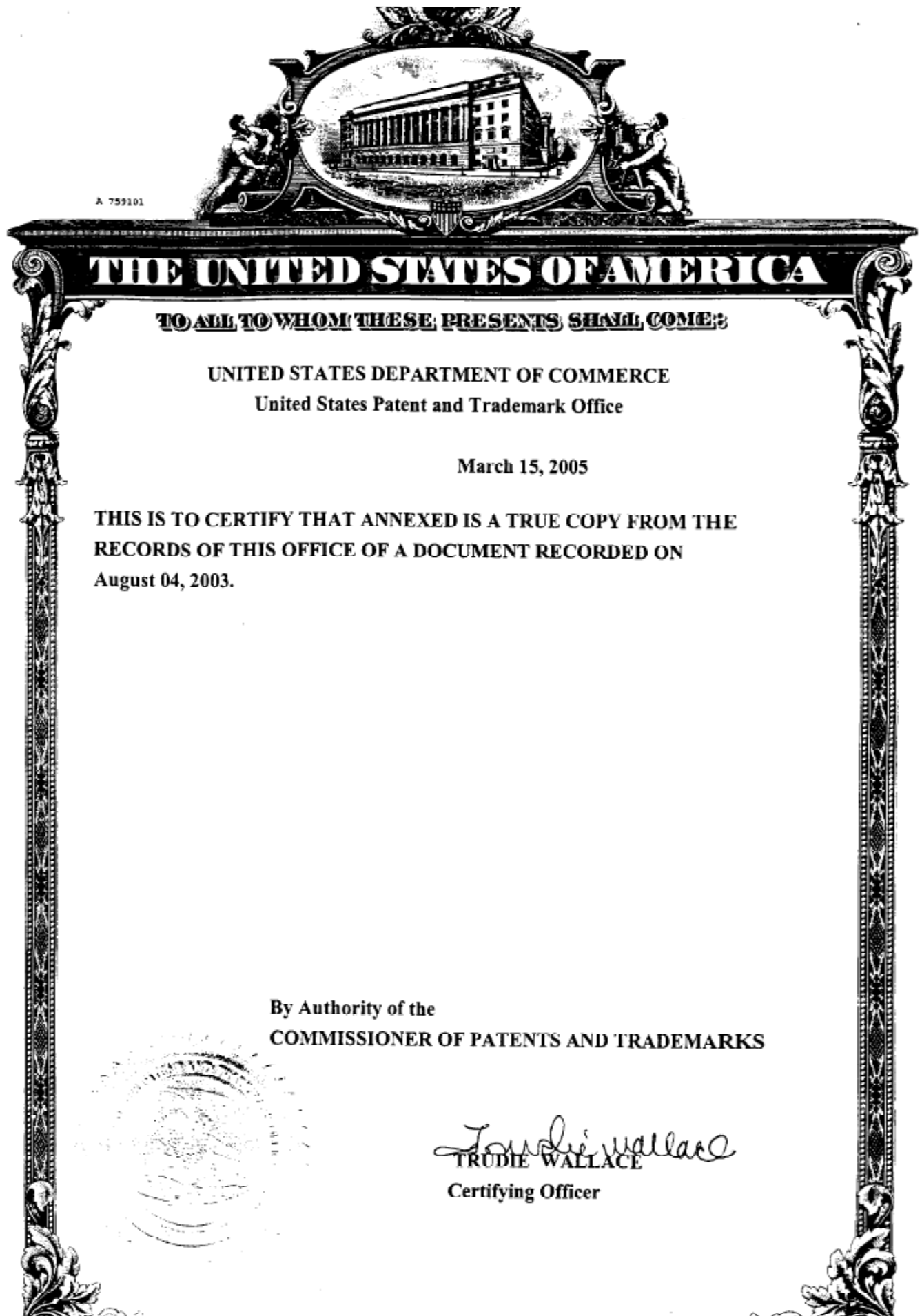


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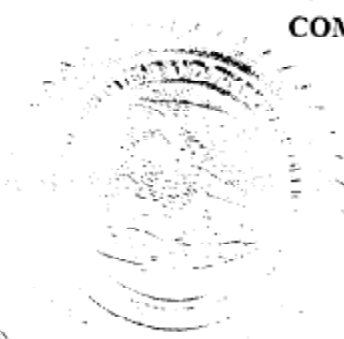
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Title of the Invention

MODIFIED VACCINIA ANKARA VIRUS VARIANT.

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Assignee

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EXHIBIT 3

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US006913752B2

(12) **United States Patent**
Chaplin et al.

(10) Patent No.: **US 6,913,752 B2**(45) Date of Patent: **Jul. 5, 2005**

(54) **MODIFIED VACCINIA ANKARA VIRUS
VARIANT**

(75) Inventors: **Paul Chaplin**, Munich (DE); **Paul
Howley**, Martinsried (DE); **Christine
Meisinger**, Grobenzell (DE)

(73) Assignee: **Bavarian Nordic A/S**, Copenhagen S
(DK)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 56 days.

(21) Appl. No.: **10/439,439**

(22) Filed: **May 16, 2003**

(65) **Prior Publication Data**

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Related U.S. Application Data

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(30) **Foreign Application Priority Data**

Nov. 23, 2000 (DK) 2000 01764

(51) Int. Cl.⁷ **A61K 39/285**; A61K 39/295;
C12N 7/00; C12N 7/01; C12N 15/863

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435/320.1

(58) Field of Search 435/235.1, 236,
435/237, 320.1; 424/199.1, 208.1, 232.1,
278.1, 281.1, 93.2, 93.6; 536/23.72; 514/44

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Primary Examiner—Mary E. Mosher

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Sage

(57) **ABSTRACT**

The present invention provides an attenuated virus, which is
derived from Modified Vaccinia Ankara virus and charac-
terized by the loss of its capability to reproductively repli-
cate in human cell lines. It further describes recombinant
viruses derived from this virus and the use of the virus, or
its recombinants, as a medicament or vaccine. A method is
provided for inducing an immune response in individuals
who may be immune-compromised, receiving antiviral
therapy, or have a pre-existing immunity to the vaccine
virus. In addition, a method is provided for the administra-
tion of a therapeutically effective amount of the virus, or its
recombinants, in a vaccinia virus prime/vaccinia virus boost
innoculation regimen.

31 Claims, 12 Drawing Sheets

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Fig. 1A

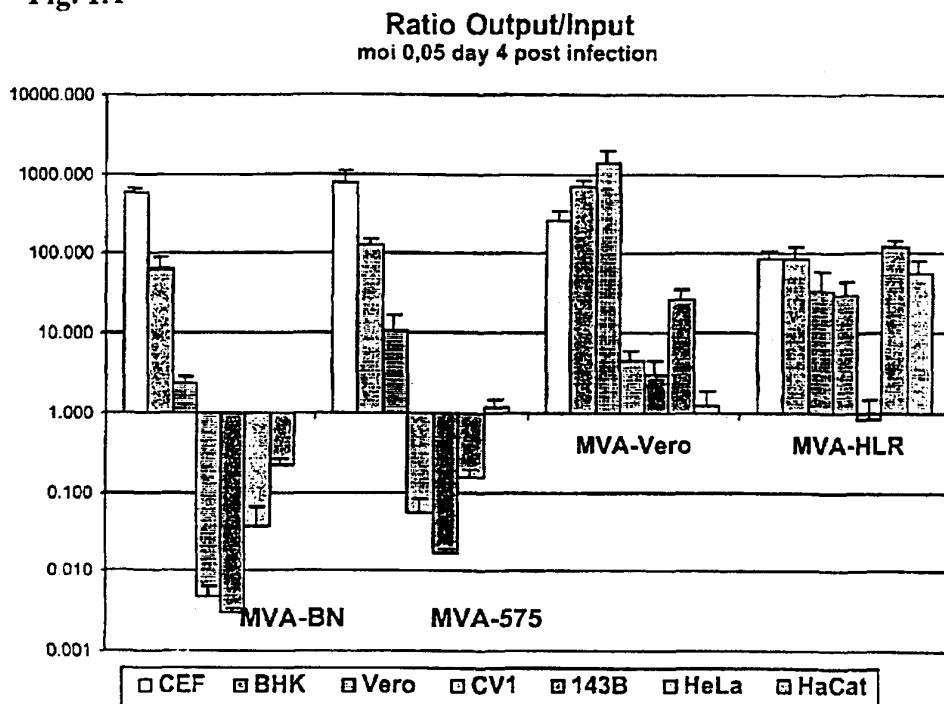
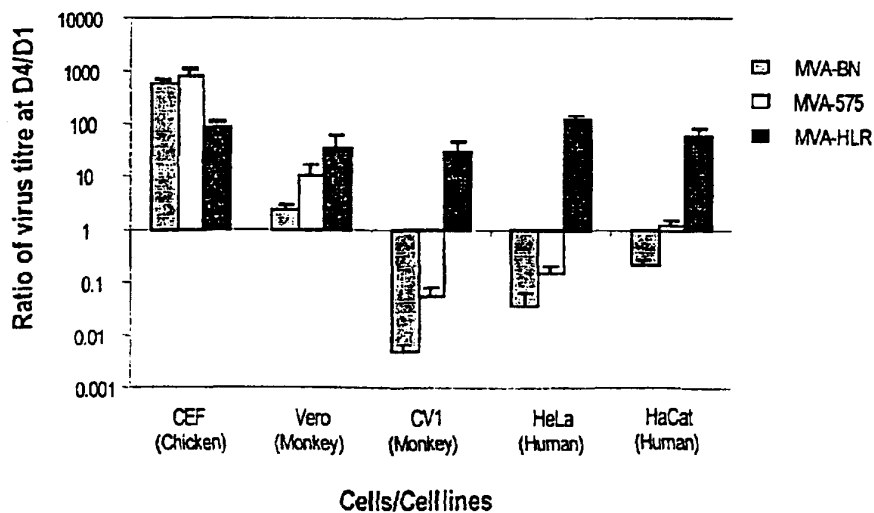


Fig. 1B



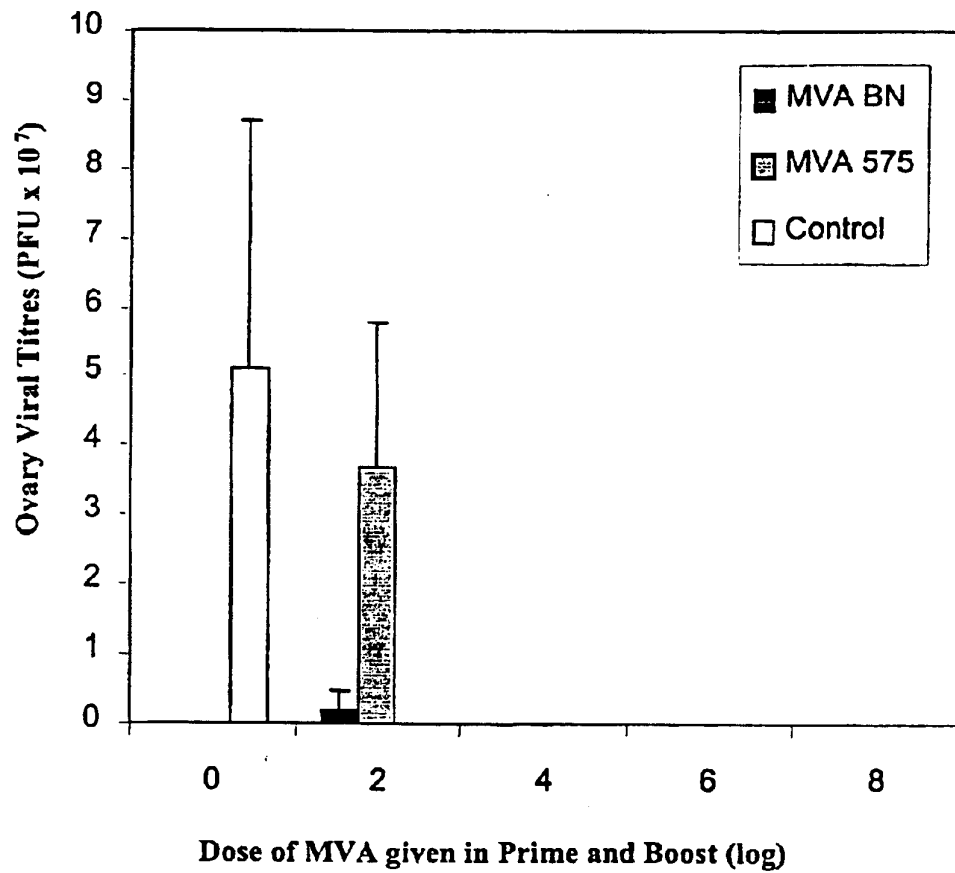
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Fig. 2



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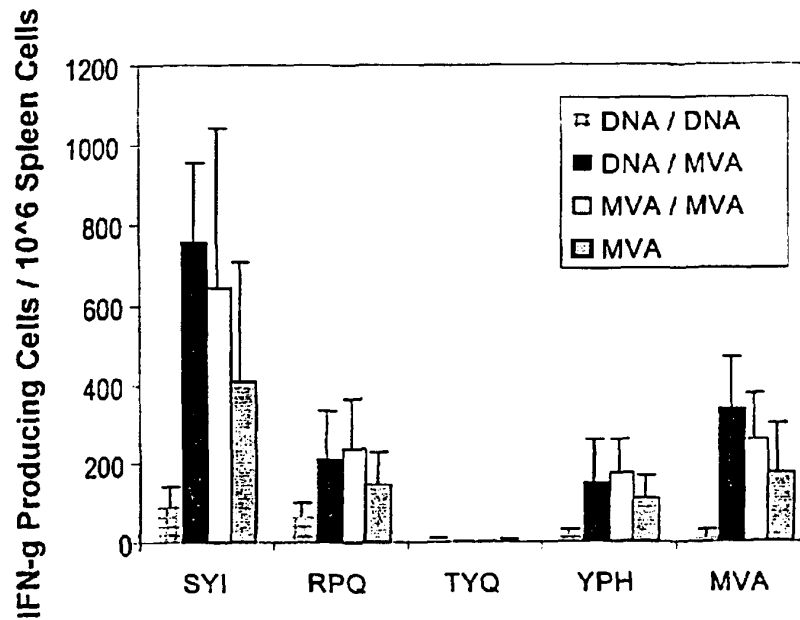
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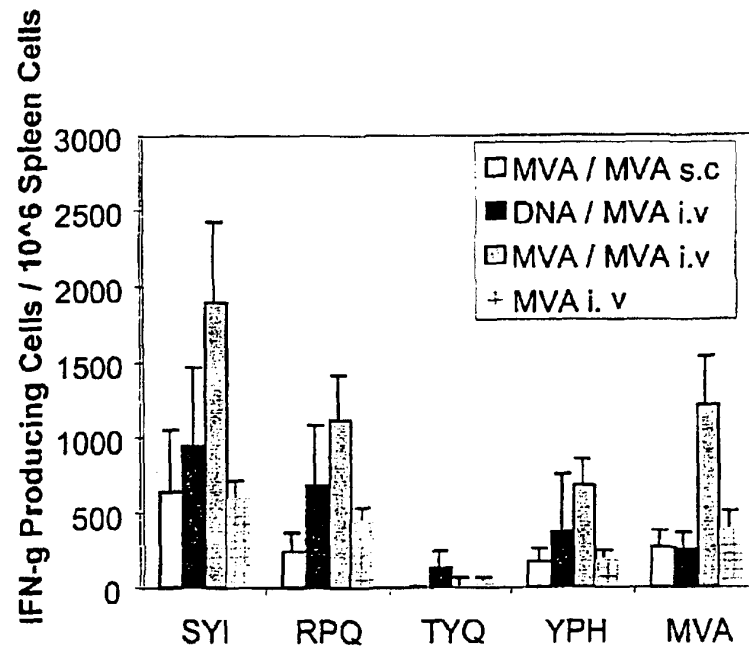
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Fig. 3

A



B



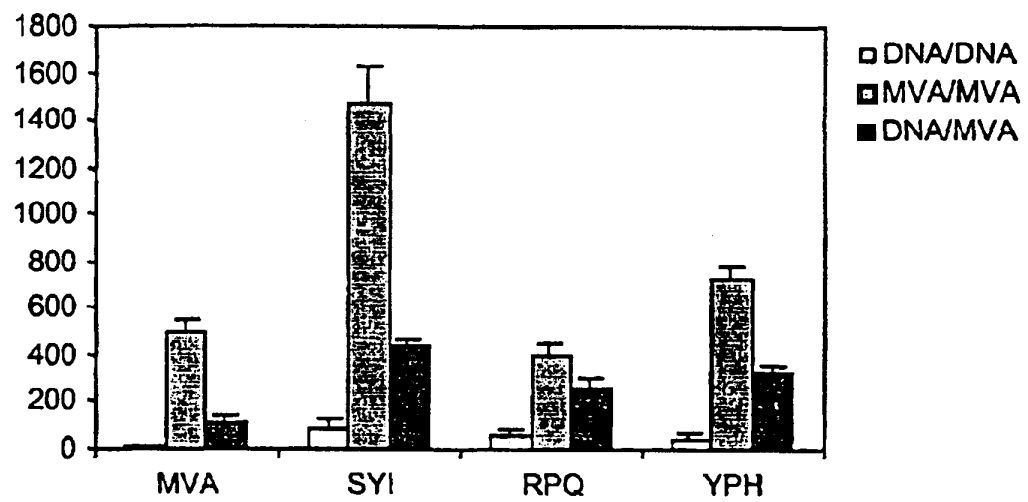
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Fig. 3C



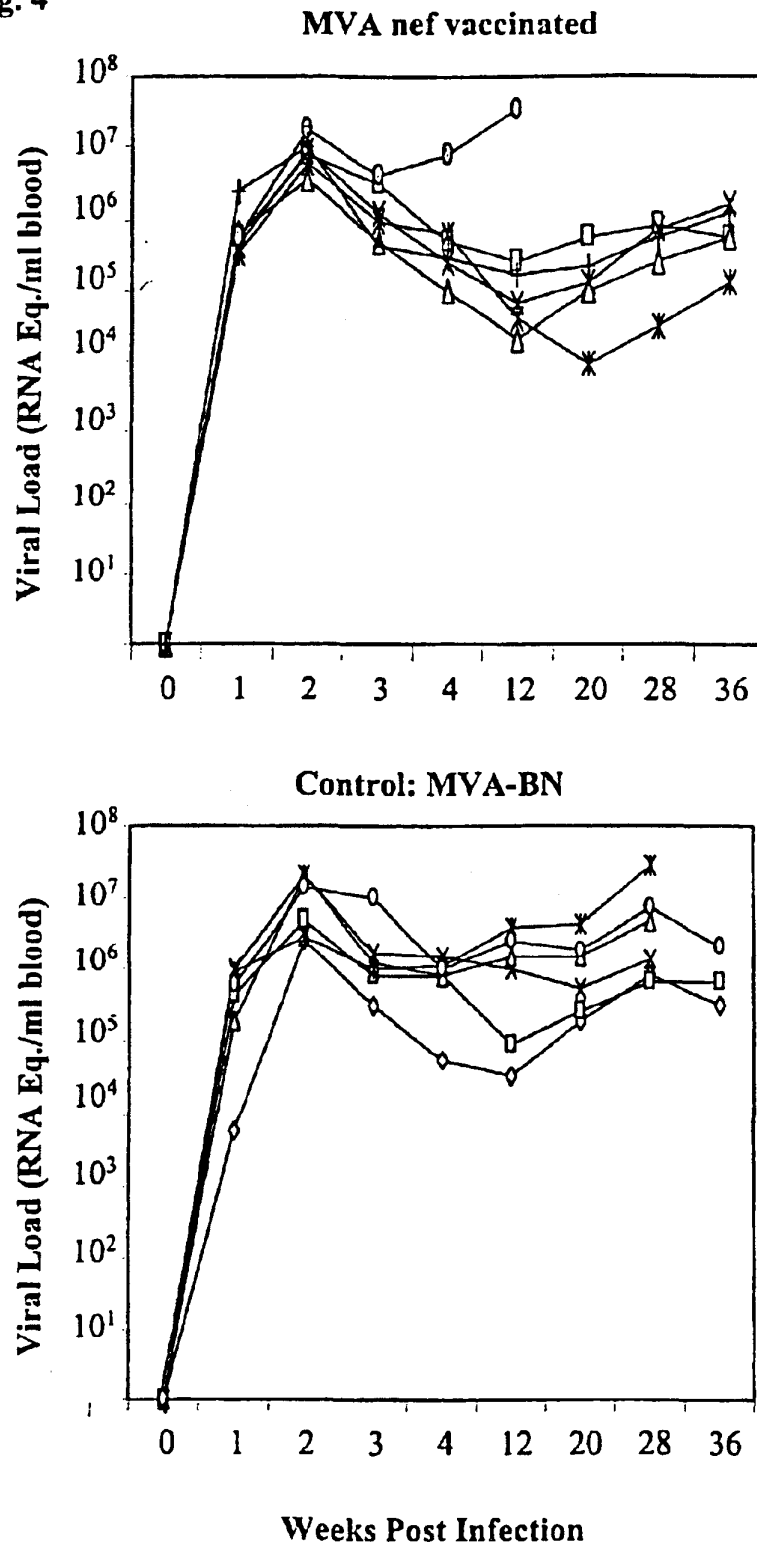
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Fig. 4



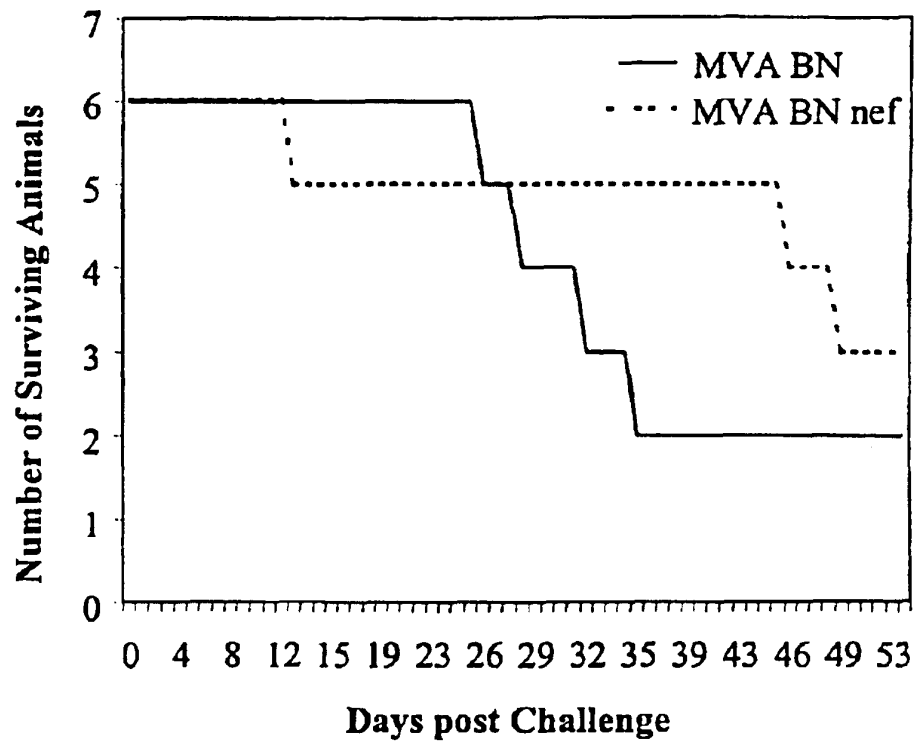
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Fig. 5

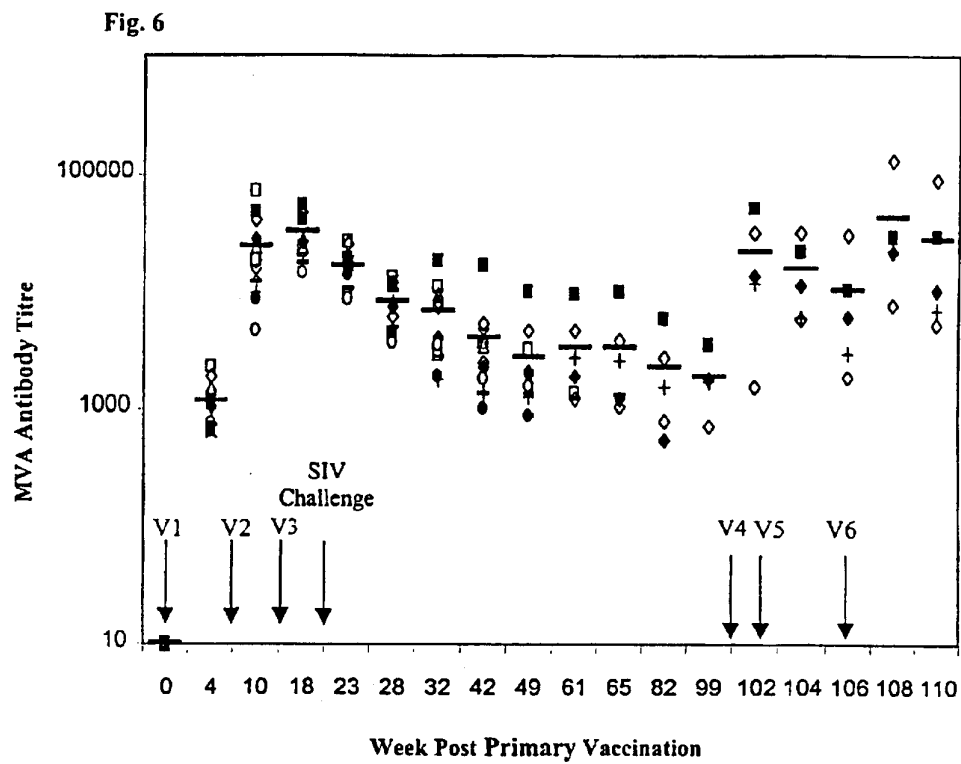


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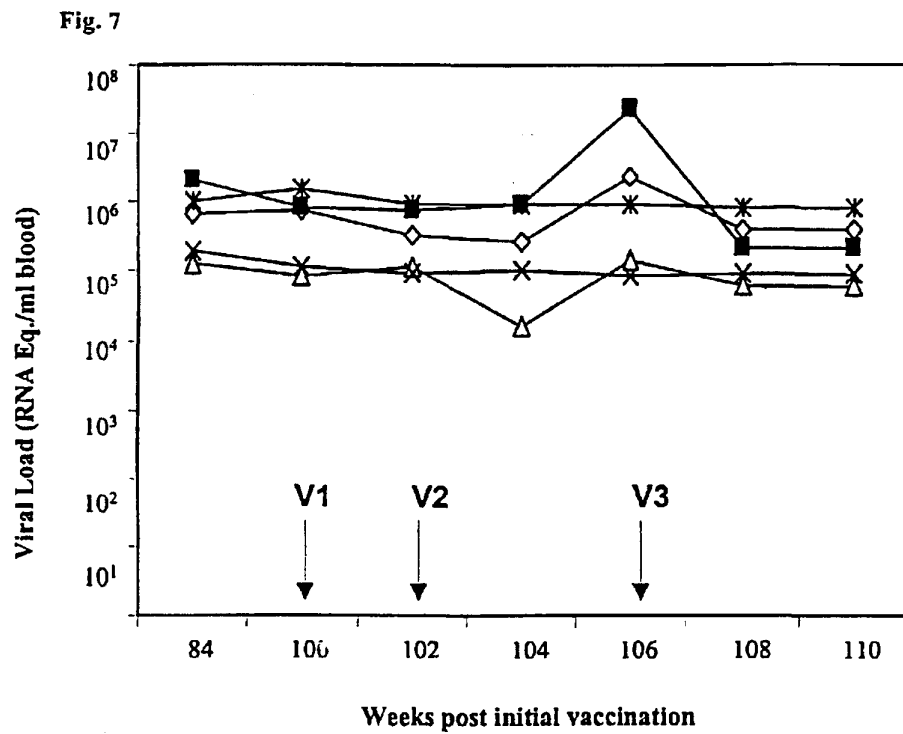


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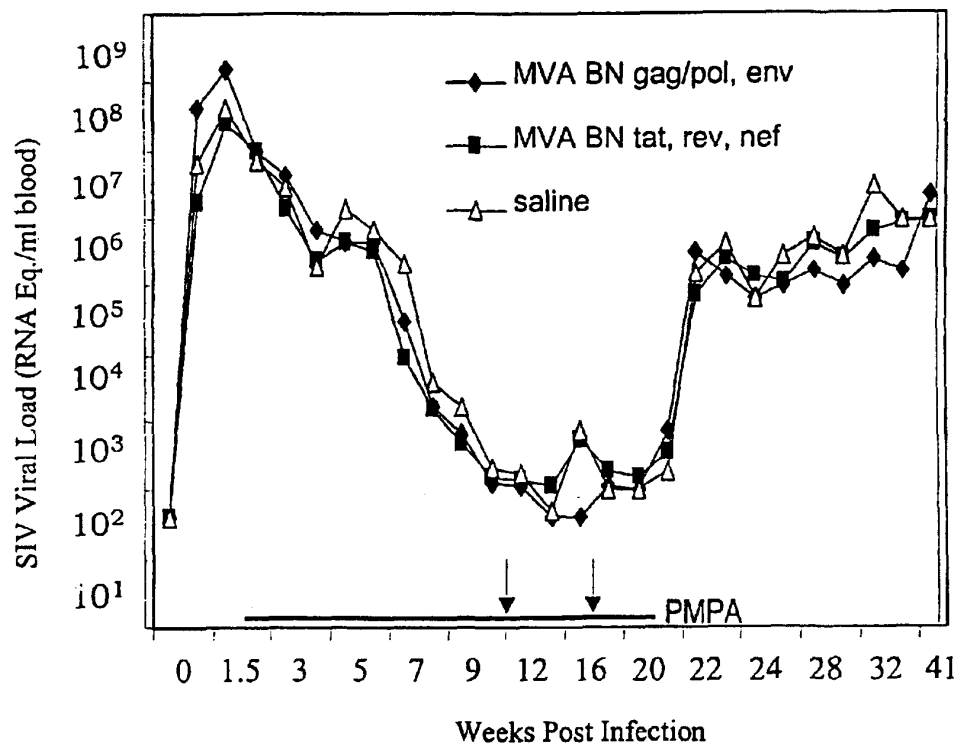
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Fig. 8



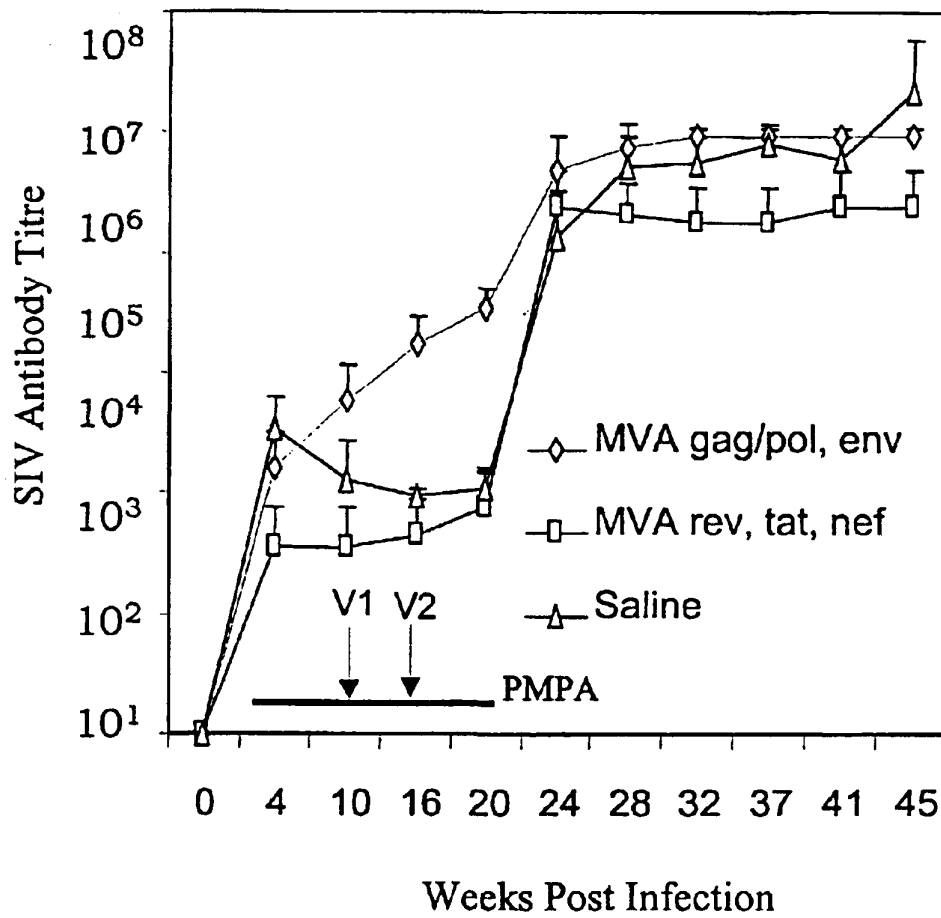
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Fig. 9



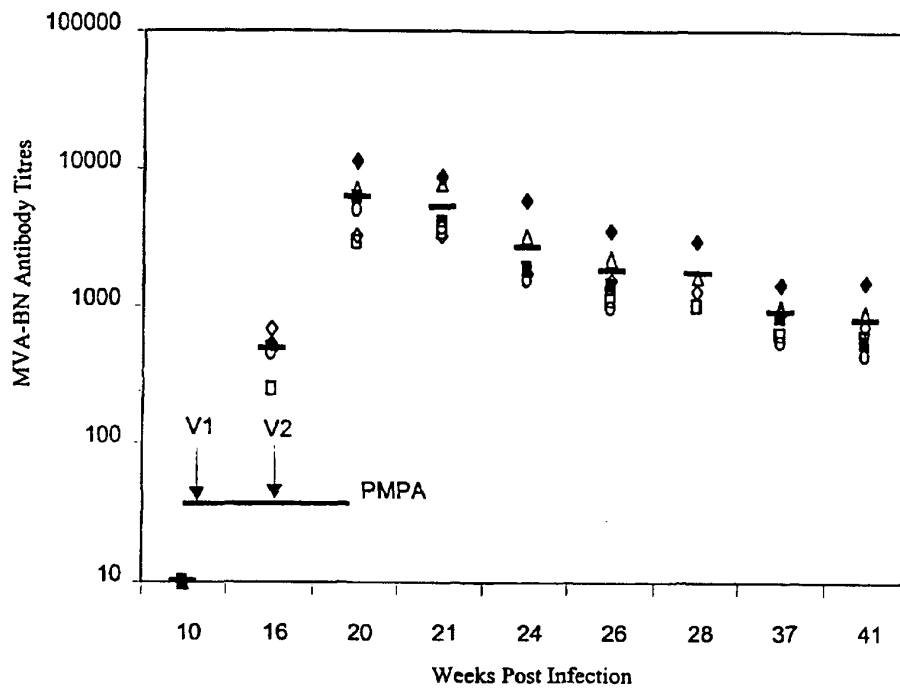
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Fig. 10



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Fig. 11

